In the Mix: Middle Housing and Income Diversity in Atlanta

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Executive Summary

Over the last couple of decades, the City of Atlanta's population has experienced major demographic shifts. These shifts amplify a nationwide conversation about gentrification, displacement and the availability of affordable housing stock. What's wrapped up in these discussions but often not explicitly stated are the historical catalysts for a highly segregated country, both racially and socioeconomically. Mid-20th century housing policies set the stage for concentrated, intergenerational poverty in our cities with far reaching, long term effects. One of these policies is the establishment of exclusionary zoning, often resulting in neighborhoods that only allow single-family homes.

Exclusionary zoning prevents low-income residents from having access to the education and employment opportunities typically found in wealthier neighborhoods. The way our country's public schools are zoned and funded all but ensures that children who grow up in neighborhoods with a higher median income will attend schools that have more resources, contributing to a cycle that concentrates both wealth and poverty, spanning generations. On a more immediate level, amenities such as grocery stores and utilities like police and fire are unevenly dispersed in a similar way when wealth and poverty are concentrated. Some cities have begun the process of eliminating their exclusionary zoning policies, but reversing decades of economic segregation is no easy task.

This study explores a potential correlation between Atlanta's modest supply of middle housing (often referred to as "missing middle"), and income diversity among residents. I utilize a multiple regression analysis, using the percentage of homes that can be defined as middle housing, and an income diversity index further detailed below. Every block group in the City of Atlanta is analyzed-- 326 observations in total.

There is indeed a positive correlation, and I hope that this and other studies can be used to further the zoning debate to allow more missing middle housing in our neighborhoods, and potentially eliminate exclusionary zoning completely. It is my intention that my analysis will contribute to policy-relevant conclusions about these issues in Atlanta and other cities across the country.

Introduction

My project attempts to determine if the existence of middle housing in a block group affects an index of income diversity among residents. Middle housing in this context is defined as a residential structure with multiple units (ranging from townhomes to 9-unit buildings) that fits, both in scale and in character, within a majority detached single-family housing neighborhood.

Parolek, Daniel. "Responding to the Demand for Walkable Urban Living"

Income diversity is important in a neighborhood because it improves long term economic outcomes for cities and their residents. When an area experiences concentrated poverty, residents not only have worse schools and crime rates, but their chances of eventually getting out of poverty are incredibly low. There are fewer good jobs and worse quality of life and health outcomes. Cities can end up losing billions of dollars in potential income through less-educated residents and higher crime (Acs et. al), meaning that *all* residents benefit from income diversity-- not just the poor.

Studies (such as Raj Chetty's *Moving to Opportunity*) have shown that when children move from more-segregated areas to less-segregated areas when they are still adolescents, they have a much higher chance of eventually making more money than they would have if they did not move. In the case of black children moving from high-

poverty to low-poverty areas, the income differences are 40% higher. According to Rothwell and Massey, the level of education among a child's neighbors is almost as great of an effect as the level of education of that child's parents (about two-thirds as great).

In Atlanta specifically, there is a dearth of safe neighborhoods to walk and bike in, given decades of automobile-prioritized development. Most of the neighborhoods with sidewalks and low speed limits are historic streetcar neighborhoods such as the Midtown Garden District and Virginia-Highland, which skew on the higher side of the income spectrum. When low-income folks are able to rent or purchase homes in these neighborhoods, they are more easily able to forego a car than those in the sprawling, ranch-style developments found elsewhere in the city. *Figure 1* shows the diversity of unit mixes in a 2-block radius in the Midtown Garden District.

Integrating more middle housing into our single family neighborhoods is one way to increase income diversity. Smaller units tend to be more affordable than single family houses, and the benefits noted by the authors in my literature review would accrue due to children growing up surrounded by neighbors of a higher socioeconomic status. The children in these census tracts would all be zoned to the same public schools, use the same grocery stores and libraries, and be served by the same police, fire and utility services. These benefits, given affordability, would provide the impetus to build and zone for more middle housing and therefore more equitable communities and cities.

In order to answer the key question, I've used census data from the American Community Survey. My study area is every block group in the City of Atlanta boundaries – 326 observations. A measure of income diversity has been calculated for these 326 block groups, using American Community Survey table B19001, and an equation that is detailed in the methods section. Finally, a multiple regression analysis is performed on the independent (percent of housing in a tract that has two to nine units) and dependent (income diversity index) variables.

Figure 1. Diversity of unit mixes in Atlanta's Midtown Garden District

Literature Review

Carriage House, or Accessory Dwelling Unit (Kronberg Urbanists & Architects)

Why is income diversity important?

As mentioned earlier, income diversity in a neighborhood is important, especially when the socioeconomic and racial makeup of the city as a whole is diverse. Neighborhoods that reflect the city's varied citizens ensure that all residents receive equitable services. A 2017 Urban Institute report looked at whether economic and racial segregation has negative effects on people with lower incomes, as well as the residents and area as a whole. It found that higher levels of economic segregation are associated with lower incomes for blacks, lower educational attainment for whites and blacks, and lower levels of safety for all residents in the area (Acs et al. 2017).

Segregated neighborhoods lead to segregated schools, as well. An interactive feature from Vox produced in 2018 visualizes school district segregation. The article explains the details and history behind Federal Housing Administration segregation and its effect on today's school systems, and therefore unequal outcomes among our nation's students (Chang 2018). The tool uses data from Meredith Richards' 2014 paper, which

concludes that school district boundaries more often than not serve to reinforce racial disparities in districts. Attendance rezoning can serve as a legal means to integration in municipalities that have historically been segregated (Richards 2014).

The benefits accrued to children in low-income families who move to a neighborhood with a higher median income last far beyond primary school years. Raj Chetty's work has proved that the adult incomes of children who move during their childhood converge to the incomes of permanent residents in the new destination, at a rate of 4% per year of childhood exposure. In essence, every additional year of childhood spent in a better environment improves that child's long-term incomes (Chetty and Hendren 2018). Chetty and his team used deidentified tax records to track children who moved during childhood, versus those who stayed in the same place throughout their childhoods. This work echoes Rothwell and Massey, who found in 2015 that neighborhood income has roughly half the effect on future earnings as parental income. This study used the Panel Study of Income Dynamics to create a database of paired parent-child incomes over time, which were then attached to the relative census tracts. The authors found that lifetime household income would be $635,000 higher if a person born into a bottom-quartile neighborhood was to be raised in a top-quartile neighborhood (Rothwell and Massey 2015).

However, income-diverse neighborhoods are not as common as they once were. A 2008 article sought to find out to what degree very low-income (making 50% AMI or below) families live in income-diverse neighborhoods, and how income diversity has changed in the past few decades. The authors found that neighborhoods with medians at the extremes of the income distribution-- very high and very low-- are the least diverse, and that the most diverse neighborhoods have been decreasing in share over time (Galster, Booza, and Cutsinger 2008).

The concept of tying missing middle housing to socioeconomic diversity is not new. Emily Talen studies urbanism and its connection to equity. A 2005 article titled "Land

Use Zoning and Human Diversity" explores the degree to which planners should be connecting social diversity with physical diversity in cities. She concludes that if socioeconomic diversity exists in a place, it is in spite of the physical characteristics, and that planners must prioritize equitable design when thinking about their cities (Talen 2005). A second of Talen's articles provides a framework for evaluating social and ecological diversity in neighborhoods. She analyzes both the physical attributes of cities that have historically segregated sub-groups, and the attributes that have (more recently) engendered diversity. Some of these physical attributes include reversing exclusionary zoning codes and allowing more housing types, such as missing middle (Talen 2006).

Stacked duplex (Daniel Parolek)

The connection between middle housing and income diversity

When cities are debating whether to allow or add more middle housing (especially duplexes and triplexes), they are often trying to mitigate affordable housing crises stemming from a lack of supply. This was a key point in Minneapolis' historic push to eliminate exclusionary zoning just last year. A New York Times article details the reasons and history behind this policy change (Mervosh 2018). Proponents of the policy

argued that single-family only zoning artificially drives up the prices of housing all across the city (Kahlenberg 2019).

A report published by Enterprise Community Partners in 2015 analyzed small and medium multifamily (SMMF) housing, defined as housing between 2 and 49 units, using geographic distributions, cross-category comparisons, and changes over time. The authors found that SMMF provides homes for 60% of all renters who make less than $10,000 a year (An et. al, 2015). The study also found that *smaller* multifamily buildings tend to be a better value than larger multifamily: “Plainly, the smaller the building, the more rooms, bedrooms, and square feet a unit contains” (Ibid.). Therefore, small multifamily buildings-- or middle housing-- tend to be a good opportunity for low income families with children.

Of course, while middle housing units are inherently more affordable than the single family homes that surround them, they are not necessarily affordable in the sense that someone making half the area median income could afford to rent any middle housing unit in the city. In addition, in her piece for Next City, Amanda Kolson Hurley acknowledges that the connection between housing type and affordability is “fuzzy”. She notes that existing middle housing is often cheaper because it “tends to be older and therefore in worse repair” (Kolson Hurley, 2017). However, since single-family zoning effectively caps the supply, or number of new units that are able to exist, it’s fair to say that taking off that cap would help to lower prices.

My study is not looking at only new middle housing that’s been built. I want to know whether neighborhoods that have historically had middle housing (and in Atlanta, those units were often built in the 1920s and 30s) are more socioeconomically diverse than those that have not. However, I hope that my results will be able to contribute to the conversation around whether exclusionary zoning should be eliminated, in Atlanta and in the rest of the country. One aspect of that conversation touches on existing middle housing’s tendency to be located in transit-rich, amenity-rich environments, which could

only be strengthened should local municipalities choose to upzone those areas (Parolek, 2019).

The conversation also includes Jeongseob Kim's 2016 study on the effect of infill housing on neighborhood diversity. Kim found that the effect varies depending on neighborhood type: housing types in infill areas *are* more diverse than those in urbanized areas and urban fringe areas, however, infill housing in higher income neighborhoods does not appear to attract relatively lower income households. The author concluded that infill development *itself* does not promote mixed income communities, except in gentrifying communities. Infill missing middle development was also studied over a decade ago, in New Jersey. A task force armed with a $25,000 grant was convened to study alternatives to the local "Bayonne box"-- a cheaply built, narrow, often multi-unit style of housing that designers, political officials and residents alike felt were an architectural scourge. However, the study resulted in officials acknowledging that the "boxes" are an asset in terms of affordable housing, especially for the region's relatively large immigrant population (Abousleiman, 2017).

Studies suggest middle housing issues as they relate to supply-demand imbalances will increase in coming years. Arthur Nelson, a planning and real estate professor, argues that a three-pronged transformation in residential development is taking place in American suburbs: demographics are changing, energy prices are increasing, and consumer preferences around transportation are shifting. The result will be, according to Nelson, that by 2030 there will be a severe spatial mismatch between the kind of housing Americans want and what they'll be offered. His recommendations include (among other big-picture frameworks) utilizing Accessory Dwelling Unit friendly zoning, leveraging private reinvestment, and providing dense, downsized, affordable housing (Nelson 2012). A 2019 Washington Post article explores recent trends in home buying. The author finds that millennials would prefer to buy smaller homes and spend their extra money on "experiences" (Willis 2019). While young people with disposable income are not my target demographic, this does provide background on developers' post-

recession evolution in creating smaller houses. This trend may also have an effect on influencing cities' zoning codes. Finally, Clare Healy's option paper written earlier this year, analyzes the supply and demand dynamics surrounding missing middle housing from a business-development standpoint. The author's intention was to spur interest and action among local stakeholders by identifying the community benefits when missing middle exists, as well as point out bureaucratic roadblocks to this type of development (Healy 2019).

Side-by-side duplex (Daniel Parolek)

Other affordable housing strategies and income diversity

Explicit affordable housing strategies have also been studied in conjunction with their effects on income diversity. A 2014 article in the Journal of Urban Affairs looked at the effect of inclusionary zoning programs on racial and income integration and neighborhood change, using an entropy index. The study showed that neighborhoods that were more likely to receive inclusionary zoning were more racially integrated to begin with, and that the effect of the inclusionary zoning units was dependent on the initial socioeconomic and racial characteristics (Kontokosta 2014).

A 2013 study found that mixed-income housing strategies like inclusionary zoning (housing developments that hold a percentage of units for low-income families) are unlikely to achieve immediate reductions in household poverty without changes in the quality of education and availability of good jobs. However, the authors also found that 75% of low-income residents that move to these types of developments report psychological and mental health benefits, and that children who relocate to income-diverse areas have fewer behavioral and health problems (Levy, McDade, and Bertumen 2013).

Much of the existing literature that finds fault with the deconcentration of poverty is focused on the negative effects of demolishing housing projects and other urban renewal efforts that displace and disperse the urban poor. Relocation of families through residential mobility programs from high-poverty to low-poverty neighborhoods may actually be to the detriment of middle-school and high-school aged children, who must quickly transition to new schools without further assistance beyond the initial move (Fauth 2004). These efforts do not focus on creating additional units and often cut families off from desperately needed social networks and community groups. Goetz and Chapple agree that dispersal efforts are ineffective, especially when compared to community economic development interventions, such as supporting community development financial institutions (CDFIs) and workforce development initiatives (Goetz & Chapple, 2010).

Fourplex (Sightline Institute)

Atlanta case selection relevancy

My choice to study Atlanta neighborhoods is in part because Atlanta is one of the more diverse cities in the United States, but it is also one of the most unequal in terms of income distribution. The Urban Institute report found that the United States as a whole is very segregated by race and income, but the cost of that segregation to an individual varies by their race and ethnicity (Acs et al. 2017). Much of the economic and racial segregation we see today is the long-term effect of racist policies utilized by the Federal Housing Administration in the mid-20th century in order to keep black families from owning homes and moving into white neighborhoods. In Atlanta, an explicit racial zoning law was on the books as late as 1922, and was used by the city for decades despite its unconstitutionality (Rothstein 2017). Eventually, what was known as “colored” and “white” districts morphed into “high density” and “low density”, or “multifamily” and “single family” zoning. In 2006, the Brookings Institution found that the Atlanta metro was one of the most sprawling in the country, where one in five metro cities and half the counties were zoned for low-density only (“Metro Summaries” 2006).

Atlanta's 100 Resilient Cities plan, released in 2017, cites suburban sprawl, segregation, and a lack of investment in affordable housing as some of Atlanta's greatest modern challenges. While Atlanta is historically one of the most ethnically diverse cities in the country, it is not *spatially* diverse. The metro area remains heavily segregated along a diagonal line that runs northwest to southeast. Moreover, Atlanta has the highest income inequality of any city in the United States-- a title it continues to claim year after year, according to the National Equity Atlas, Bloomberg, and the Brookings Institution. The Resilient Cities report claims that the city's poverty is disproportionately experienced across races: 85% of Black children live in high poverty communities, compared with just 6% percent of white children (Resilient Atlanta, 2017). Recommendations suggested in the report include improving the preservation and quality of existing affordable housing stock and encouraging the development of mixed-income housing.

The Atlanta City Design plan was also released in 2017. This report aims to promote smart, sustainable design of the physical environment to work for the city's diverse citizens. It highlights the need for the city to push policies that work toward equitable results, and again illustrates the economic disparities between black and white residents of the city. Relevant recommendations are found in a section on Housing Innovation & Affordability and include maintaining a healthy supply of housing at various price points, experimentation with housing types and models, and finally, eliminating barriers to middle housing (Atlanta City Design, 2017).

Finally, Christy Dodson's option paper from 2018 argues in support of housing diversity through middle housing in Atlanta, and analyzes the relationships between housing diversity, social capital and neighborhood resilience. The history of Atlanta's zoning code is also examined. She concludes that diversity of housing choice is necessary for an equitable and inclusive city (Dodson 2018).

Data

I used American Community Survey block group level data for both of my variables. The middle housing share variable is determined from ACS table B25024, “Housing Units”. This table provides the percentage of all homes in an area that have a certain number of units. The table for the geography of all of Atlanta is shown below:

Column →	Atlanta, GA	
1, detached	39.9%	±0.5%
1, attached	4.5%	±0.3%
2.0	2.4%	±0.2%
3 or 4	4.1%	±0.3%
5 to 9	8.4%	±0.4%
10 to 19	10%	±0.5%
20 to 49	6.1%	±0.3%
50 or more	24.2%	±0.5%
Mobile home	0.5%	±0.1%
Boat, RV, van, etc.	0%	±0%

I’ve added the percentages from “1, attached” (townhomes), “2”, “3 or 4”, and “5 to 9” to create a percentage of the number of homes in a block group that are in a structure containing townhomes to 9 units.

Next, I calculated the Simpson’s Index of Diversity for these 326 block groups. I used American Community Survey table B19001, “Household Income in the Past 12 Months”.

Finally, I’ve performed a linear regression analysis on these block groups to determine if there is a correlation between the percent of middle housing and the income diversity index. *Table 1* shows a summary of the independent and dependent variables, their sources, transformations, and summary statistics. *Table 2* shows summary statistics of the four control variables.

Variable - Description	Source	Transformations
Middle housing share The percent of structures in a block group that have either: one attached unit, or 2, 3, 4, 5, 6, 7, 8 or 9 units	Census ACS 5-year, 2018 Table **B25024**	For each block group: summed the percentages of lines “1, attached”, “2.0”, “3 or 4” and “5 to 9”
Income diversity index The Simpson’s index of diversity for each block group’s income buckets	Census ACS 5-year, 2018 Table **B19001**	For each income bucket percentage ***n*** in each block group: n*(n-1) summed this result for every bucket in each block group divided result by -.99

Variable	Min	Max	Mean	SD	Units
Middle housing share	0%	73.30%	18.52%	14.72%	percent
Income diversity index	.3821	.9381	.86	.0809	D-score (scale of 0 to .947)

Table 1

Control Variable	Min	Max	Mean	SD	Units
Total population	219	10,914	1,460	983	people
Percent white	0%	100%	39%	36%	percent
Percent of population (ages 25+) with bachelor's degree or above	0%	97%	45%	28%	percent
Median age of housing (by year built)	1939*	2006	1968	18	years

**All homes built before 1939 are labeled as 1939*

Table 2

Methods

My key question, **do neighborhoods with middle housing have more income diversity than those that do not?**, examines the relationship between the independent variable, middle housing, and the dependent, income diversity. I've performed a simple linear regression analysis to determine whether the null hypothesis-- that there is no relationship between the presence of middle housing and the level of income diversity-- is false.

One weakness with any measure of income inequality is that it is tied to income segregation and therefore difficult to tease out effects of one versus the other.

To measure income diversity, I've used an equation called the *Simpson's Index of Diversity.* This index is used most often in ecology to determine the biodiversity in a habitat, but it has also been used, occasionally, in social sciences to measure racial and economic diversity of neighborhoods. It measures the probability that two individuals selected at random from the sample will be from different categories. Emily Talen, in her 2005 article on Land Use Zoning and Human Diversity, acknowledges that her use of the measure is one of the few in urban studies (Talen, 2005). She cites Byrne and Flaherty's use in 2004 as potentially the first, when the authors used the Simpson Index to look at whether the housing market was becoming more or less diverse, in terms of types of dwelling and types of occupants. Talen uses the index multiple times in her study: to measure the diversity of socioeconomic variables (income, race/ethnicity, age, housing tenure, and household type) by block group, and to measure the diversity of zonal patterns in the same areas. The Urban Institute's 2018 report *Identifying America's Most Diverse, Mixed Income Neighborhoods* also used this exact equation to measure both income and racial diversity. However, the author did not refer to it as Simpson's Index, and instead used the term "REDI": a "racial and ethnic diversity index" (Cortright, 2018).

The equation itself has been used in a few different forms. The original, known as

$$D = \sum (n / N)^2$$

Simpson's Diversity Index, is expressed as

$$D = \frac{\sum n(n-1)}{N(N-1)}$$

or , where n is the total number of organisms of a particular species, and N is the total number of organisms of all species. However, with this index, a value of zero represents infinite diversity and a value of 1 represents no diversity at all, which is counterintuitive. Therefore, I will be using *Simpson's Index of Diversity*, which subtracts D from 1 as a final step:

$$D = 1 - \left(\frac{\sum n(n-1)}{N(N-1)} \right)$$

To apply this equation to income diversity as opposed to species diversity, I've used the 16 buckets used by the Census Bureau to tabulate household income:

Total:
Less than $10,000
$10,000 to $14,999
$15,000 to $19,999
$20,000 to $24,999
$25,000 to $29,999
$30,000 to $34,999
$35,000 to $39,999
$40,000 to $44,999
$45,000 to $49,999
$50,000 to $59,999
$60,000 to $74,999
$75,000 to $99,999
$100,000 to $124,999
$125,000 to $149,999
$150,000 to $199,999
$200,000 or more

Therefore, n represents the percent of incomes in that specific bucket in that specific block group, and N will always be 100 because 100 percent of incomes in the block group are accounted for. The maximum D-score for an environment is 1 minus the reciprocal of the number of buckets over the denominator, so my index runs from zero, no diversity, to 1-(1/16)/.99 or .947, perfect diversity. In addition, each block group's D-score can be compared to the D-score of the metro area as a whole, creating a measure of block group "performance".

Results

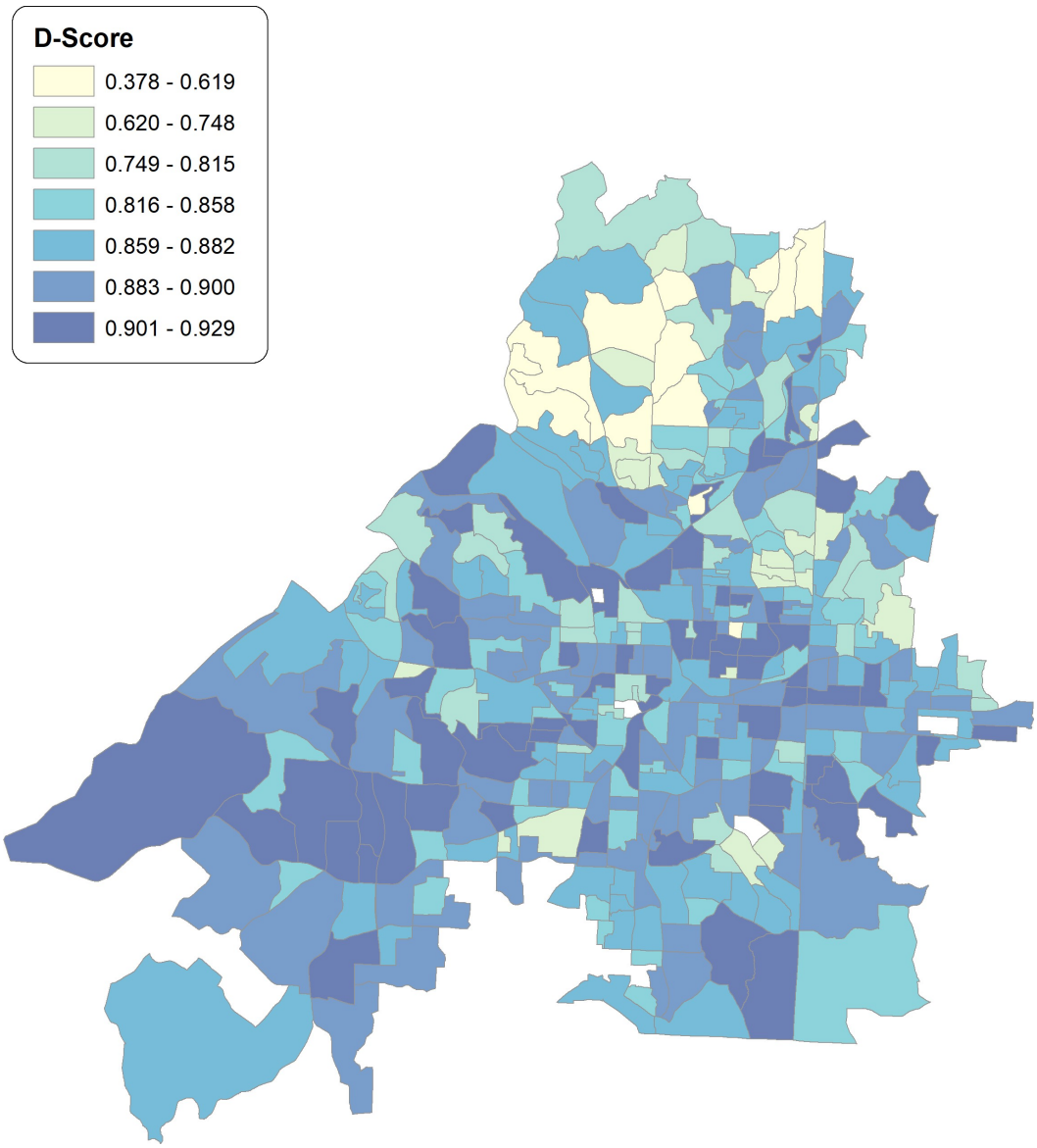

Figure 2. The D-Score, or measure of income diversity, of each block group in Atlanta.

The range of diversity scores skews higher than the percentage of middle housing. Due to the equation used, the maximum possible score, indicating “perfect” diversity, is .947. The maximum score exhibited in the study area is .9381, and the average is .86. Cluster and outlier analysis of D-Scores, in Figure 3, show that the northern parts of the city are

less income diverse while a large east-west swath and a cluster in southwest Atlanta are the most income diverse.

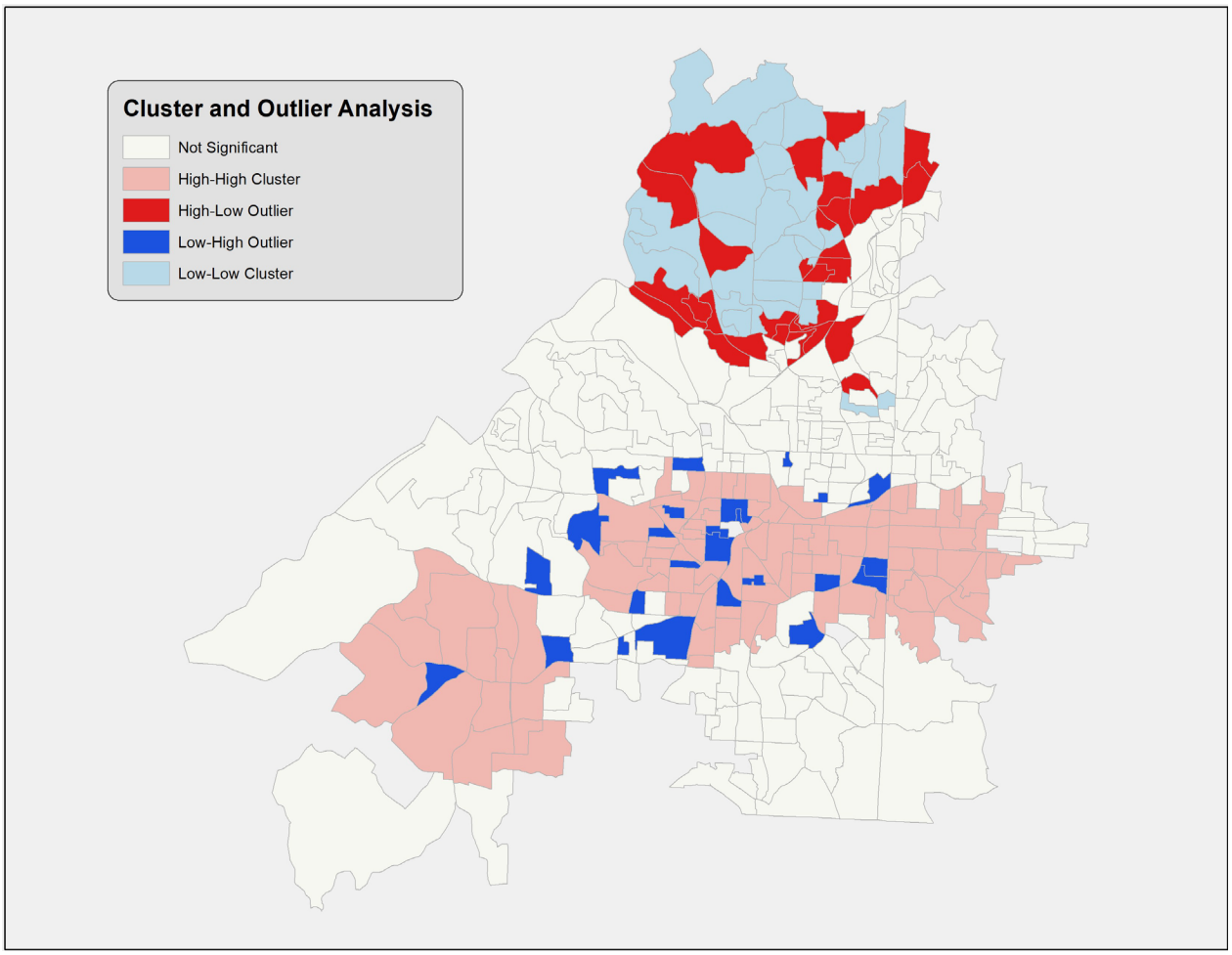

Figure 3. Anselin Local Moran's I analysis, or, Cluster and Outlier analysis, of the D-Scores.

The light blue cluster is block groups with low income diversity, and light red clusters are block groups with high income diversity. Brighter block groups are outliers—bright red block groups have high income diversity in the otherwise low income diverse cluster, and vice versa. Some outliers in the otherwise high-income diverse cluster are the result of high percentages of students living in a block group who all report a similar income. Other outliers in this cluster might be due to the presence of low-income housing, producing a similar effect.

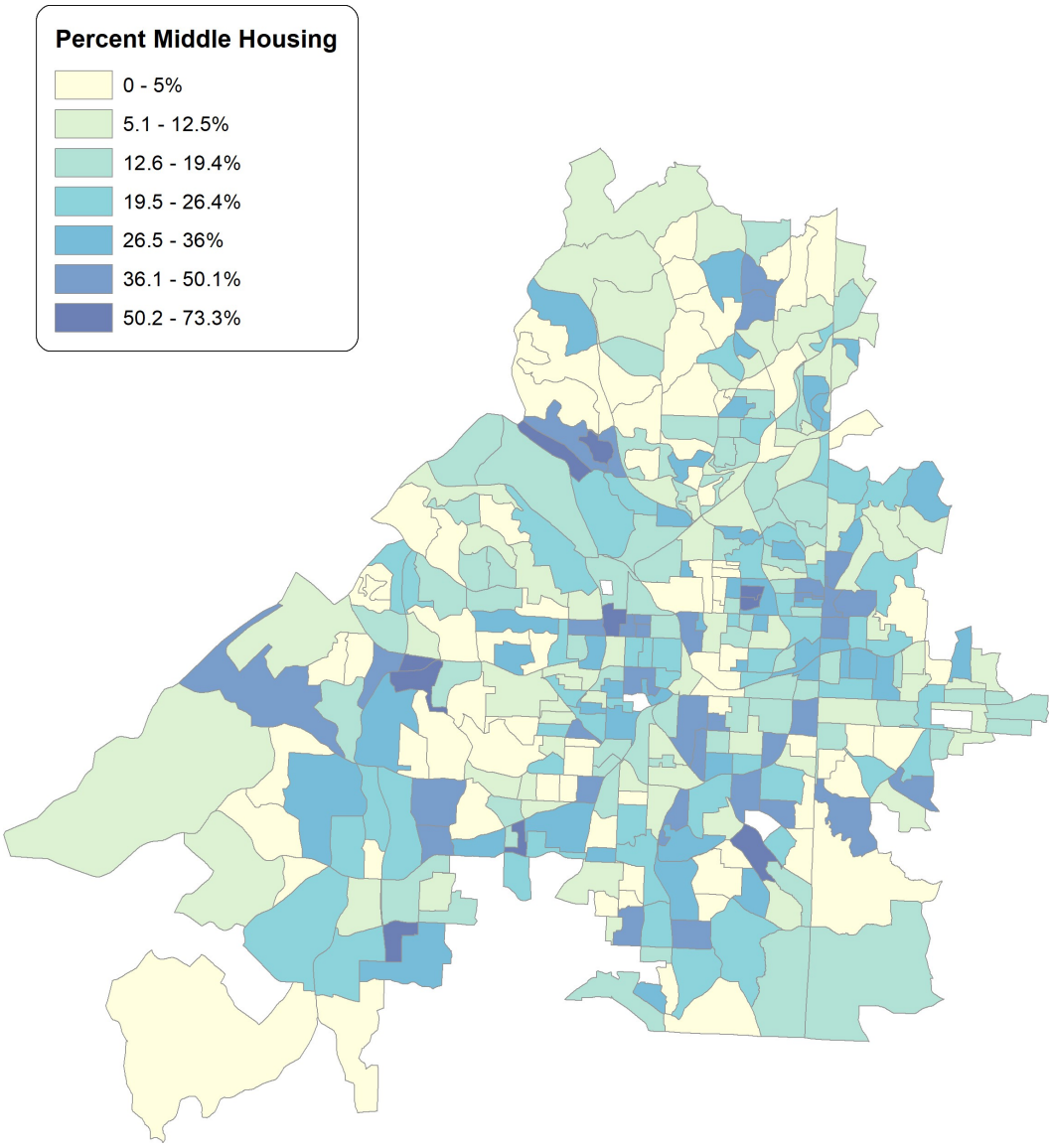

Figure 4. The percent of housing in each block group that is between 1, attached to 9 units.

The average percentage of homes in a block group that are middle housing is 18.52%, citywide, with a standard deviation of 14.72%. The maximum share in any one block group is 73.3%, while many areas have no middle housing at all. Block groups in Atlanta with unusually high percentages of middle housing are often either in historic areas of the city or have small apartment complexes with 9 or less units per building.

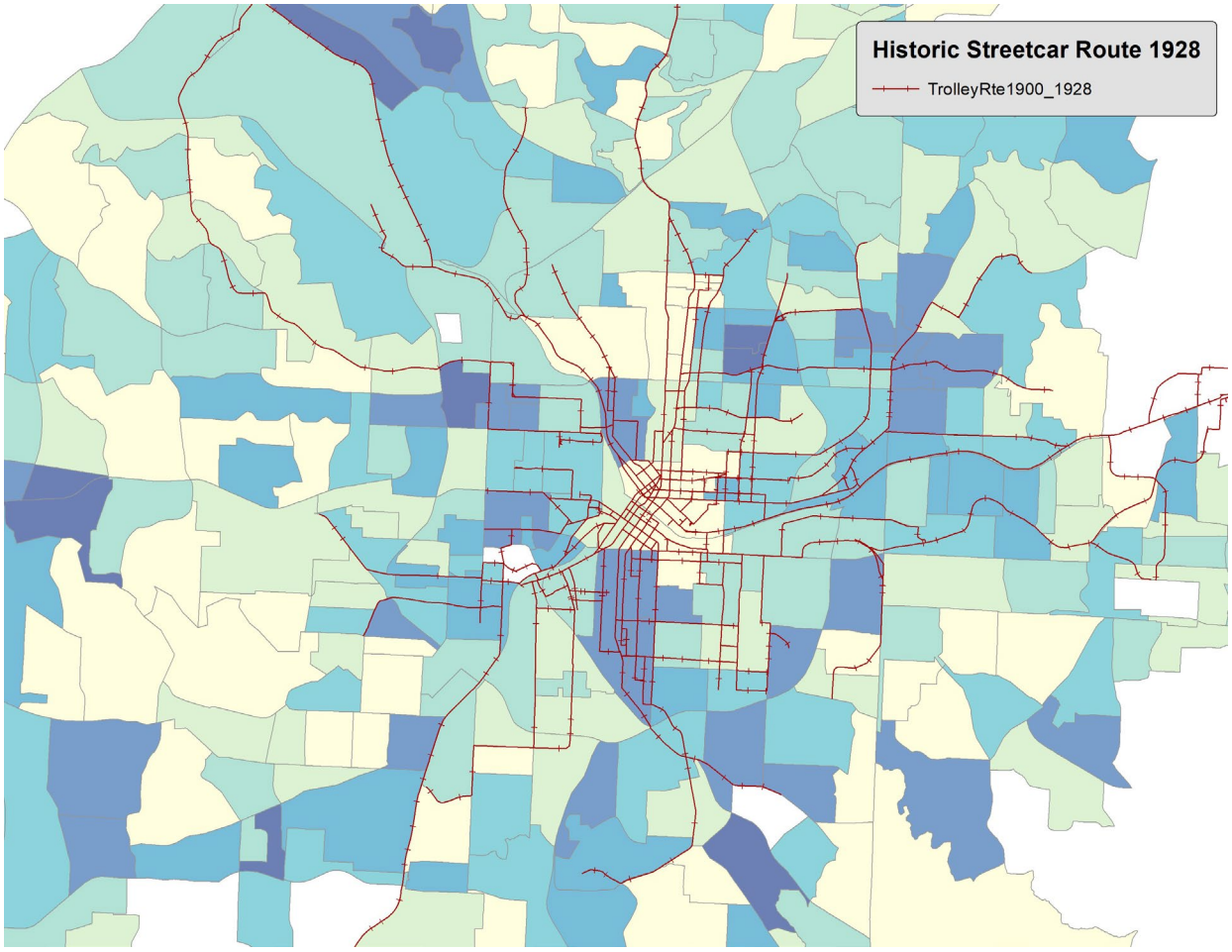

Figure 5. Percent of middle housing in each block group and historic streetcar route (1928 Streetcar Route, 2015).

Figure 5 is a larger-scale version of Figure 4, depicting again the percent of middle housing by block group, but overlaid with the city's historic streetcar routes that were functional between 1900 to 1928. While the majority of Atlanta's development occurred after this time, it's clear that some of today's existing middle housing is historic and was built along these streetcar lines.

Correlation and multiple regression analyses were conducted using R to examine the relationship between levels of income diversity and percentage of middle housing. *Table 3* summarizes the descriptive statistics and analysis results. Four control variables were introduced: the total population in each block group (totpop), the percent of residents in each block group who are white (pctwht), the percent of residents ages 25+ who have attained a bachelor's degree or higher (pctbach), and the median age of the homes in each block group (medage). These variables ensure that outcomes are appropriately weighted by each block group's population, racial minority makeup, educational attainment, and median age of homes. Each variable was scaled into standard deviations from the mean.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
(Intercept)	1.335 e-17	.004015	0.000	1.00000
% Middle Housing	0.1263	.0285	4.432	1.3 e-05 ***
Total Population	0.00001321	4.622 e-06	2.857	0.00457 **
% White	-0.07171	.02719	-2.637	0.00879 **
% Bachelor's +	-0.01711	.03426	-0.499	0.61795
Median Age of Housing	-0.0001175	0.0002557	-0.459	0.64623

Residual standard error:	0.07092 on 306 degrees of freedom		
Multiple R-squared:	0.2234	Adjusted R-squared:	0.2107
F-statistic:	17.61 on 5 and 306 DF	p-value:	2.491 e-15

Table 3. Regression output

The scaled percent of middle housing variable is positively and significantly correlated with the criterion, indicating that those block groups with higher percentages of middle housing tend to have higher income diversity scores. In addition, D-scores are significantly positively correlated with total population and significantly negatively correlated with the percent of residents who are white, indicating that higher levels of these variables contribute to higher and lower income diversity, respectively. The

multiple regression model with all five predictors produced $R^2 = .2107$, $F(5, 306) = 17.61$, $p < .001$.

As shown in *Table 3*, the percent of middle housing had a significant positive regression output, indicating that an incremental increase in the percent of middle housing in a block group results in a .1263 increase in the standard deviation of the D-Score, after controlling for the other variables in the model.

Discussion

This study intended to determine whether neighborhoods with middle housing have more income diversity than those that do not. The regression analysis resulted in statistical significance, allowing us to reject the null hypothesis, and conclude that the presence of middle housing is positively correlated with income diversity.

Among those variables determined to be statistically significant on the dependent variable include 1) the total population of the block group and 2) the percent of residents who are white. The analysis found that the more people that live in an area, the more income diverse it is. In addition, the higher proportion of residents that are white in an area, the less income diverse it is. The final two variables were not found to be statistically significant—the percent of residents ages 25 and up who have attained bachelor's degrees or higher, and the median age of the homes in an area.

These results can serve to bolster the work of previous authors as detailed in the literature review. If neighborhoods that reflect their city's income diversity ensure that all residents receive equitable services (Acs et al., 2017), then this research suggests that a variety of housing choice can promote this equity. Hopefully this can provide a contextual component to potential policy measures regarding upzoning, allowing smaller minimum lot sizes, and modifying residential parking requirements.

A simple correlation is, of course, not enough to justify building small multifamily buildings in every neighborhood. And, as Kronberg Urbanists + Architects has discovered, that's often not financially feasible, let alone profitable (Ward, 2020). The firm's analysis found that building a four-unit building in the Edgewood neighborhood of Atlanta is not financially viable for a developer, and to meet the key debt coverage ratio of 1.25 in order to qualify for most bank loans, the development in question would have to provide 10 or more units— higher than the units I used in my definition of middle

housing. Subsidized government housing or free land via a land trust would be the only ways to provide new, small multifamily.

Atlanta has already made significant changes in the last decade to its zoning, moving towards adopting a form-based code that allows for more flexible mixed-use development based on neighborhoods' existing conditions—such as lot sizes, number of stories, setbacks, parking requirement conditions, and architectural styles. Beyond this, community organizing and public engagement seems to be the most crucial factor in bringing middle housing to the forefront of policy conversations. Effective marketing is important: groups like the Sightline Institute, a sustainability-focused policy group, have begun to release talking points for advocates to use in order to make the idea more palatable to the general public-- for example, instead of talking about the *elimination* of single family zoning, the focus should shift to *lifting bans* that prevent housing choice. Healy recommends framing benefits of middle housing through environmental and economic lenses, in addition to the social and equity lenses previously discussed (Healy 2019). For instance, more people living in walkable areas has the potential to dramatically reduce vehicle use, making an environmental case. Fiscal benefits include the fact that neighborhoods can grow their tax base with small infill to a level that single family alone cannot. In addition, this infill is typically financed, built and owned by local small businesses as opposed to large scale developers.

The conclusions from this study are significant enough to warrant further research on the subject in other cities and expanded study areas. It would also be interesting to see whether the correlation holds up if the middle housing variable is split between historic and new builds, considering much of the historic housing is more affordable given that older buildings tend to be in worse repair (Kolson Hurley, 2017) (although this was somewhat controlled for in my analysis with the "median age of housing" variable). Integrating housing choice through small multifamily may require slow policy changes at the local level, but it's clear that through a more equitable spread of resources, the results will benefit future generations.

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